ATOMIC ENERGY Letter

THE FIRST AND ONLY ATOMIC NEWS SERVICE

ROBERT M. SHERMAN, EDITOR. PUBLISHED BI-WEEKLY BY ATOMIC ENERGY NEWS, INC., 509 FIFTH AVENUE, NEW YORK 17, N. Y.

November 7th, 1950.
Vol. 4...No. 6

Dear Sir:

Atomic weapon production schedules, in the United States, have been so accelerated that increasingly large numbers of such weapons are being "stockpiled", Gordon E. Dean, USAEC Chairman said in Washington last week. (Warehouse stocks of assembled casings, fissionable material units, etc., are now at a new high.) Dean also confirmed the U. S. Armed Forces training, with atomic weapons, which is underway. Now, U. S. Air Force units, using special training-type bombs, similar to certain atomic weapons in configuration and ballistic characteristics, do practice bomb runs as part of their regular air crew training.

The first non-Government nuclear reactor in the U. S. will be erected at North Carolina State College, Raleigh, N. C. A 10-kilowatt pile, it will be housed in a special laboratory. A salt of uranium-235, in solution, will be used in this unit.

Research at Knolls Atomic Power Laboratory, Schenectady, directed toward propulsion of a submarine by a nuclear reactor, shows advantages of some moment, K. A. Kesselring told the newly-formed nuclear energy division of the Metropolitan Section of the American Society of Mechanical Engineers in New York City last week. Kesselring, assistant head of the engineering division of KAPL, noted that a nuclear powered submarine: (1) could cruise submerged for periods limited only by crew's needs for oxygen (as against today's diesels that need air), (2) might have submerged speed greater than surface speed, (3) could weigh less than present models, (4) would have no dead weight of nuclear "fuel", for extended cruises.

Exempted from latest National Production Administration restrictions on building construction, is such work for the USAEC. Additionally, contractors to the USAEC had been previously allowed to apply Defense Order (DO) ratings, under the NPA's Regulation No. 2, to permit filling USAEC contracts for products and materials. (AEN 10/24/50, p. 1)

The "ostrich like attitude" of most state and local health departments towards the atomic energy industry, and its potential hazards, was criticized last week by Dr. Abel Wolman, Johns-Hopkins University sanitary engineer. Wolman told the American Public Health Association, in St. Louis, that the general public will suffer from failure to exercise control over this potentially dangerous industry, and its radioactive by-products. He said most official agencies have apparently decided to ignore the existence of the atomic trade, its products and wastes. Wolman's suggested program for public health departments included: (1) Training special people in the field of atomic energy, (2) Formulating rules of action for peacetime or wartime emergencies, (3) Recognition that a catastrophe can occur in an atomic energy plant, as in any other dangerous industry, (4) Strict regulations governing use of radioactive substances.

Subscription rates: United States, U.S. possessions, and Canada, $18.00 a year. Latin America, $20.00 a year. All other countries, $25.00 a year.

AT THE ATOMIC CITIES & CENTERS IN THE UNITED STATES...

ARGONNE NATIONAL LABORATORY, Lemont (Chicago), Ill. - With a bid of $3,999,000.00, S. N. Nielson Co., Chicago, were low bidders for constructing the biology building under the $60 million construction program underway here. Plans were prepared by Voorhees, Walker, Foley & Smith, New York architect-engineers. The design of the building is such as to furnish a facility of use in investigations of the toxicity of radiation to living organisms, particularly to extend the knowledge in this field to man. Location will utilize fully the neutron sources from the Argonne nuclear reactors, x-ray and gamma sources, and output of the cyclotron being built here.

BROOKHAVEN NATIONAL LABORATORY, Upton, L. I.- Approximately 200 scientists from 22 universities and 14 other research institutions will attend a technical symposium on nuclear physics, at Brookhaven, on November 10-11. Complex theories and mathematical analyses of neutron experiments will be described by symposium speakers including H. A. Bethe, Cornell University; Harvey Brooks, Harvard University; and B. T. Feld and J. C. Slater, Massachusetts Institute of Technology. B. B. Kinsey, National Research Council, Chalk River, Ontario, will describe neutron research in Canada, and Morton Hamermesh and C. O. Muehlhause will summarize similar work at Argonne National Laboratory. C. G. Shull will report on work at Oak Ridge National Laboratory. Brookhaven speakers will include L. J. Haworth, director of the Laboratory; L. B. Borst, chairman of the reactor project; and D. J. Hughes, of the physics department.

RAW MATERIALS...radioactive ores & other materials for nuclear work...

UNITED STATES- The minimum grade of development ore that will be accepted from producers in the Marysvale, Utah, area now has been lowered from two-tenths of one percent, to one-tenth of one percent, contained uranium oxide. However, deliveries must now average 0.15%; previously they had to average 0.30%. A development allowance, for ores with 0.10% to 0.20% uranium oxide, will be such that the payment for these ores will be $2.50 per pound of contained uranium oxide. The program, the USAEC has said, is to assist removal of low grade autunite-torbernite ores near the surface at Marysvale to reach higher grade uraninite, or pitchblende ores, that may be at depth. Further, the Marysvale ores contain only uranium oxide; there is not the vanadium which, in the Colorado Plateau area, has made it possible to mine low-grade uranium ores.

The guaranteed minimum prices that are now being paid for uranium ores mined on the Colorado Plateau have been extended to March 31st, 1958. These prices, covering carnotite-type or roscoelite-type ore, were made effective Feb. 1st, 1949, and would have expired June 30th, 1954. (Action through an amendement to Section 60.5, Title 10, Code of Federal Regulations.) The ores are those delivered to the USAEC at Monticello, Utah, for processing.

The production of uranium from phosphate ores (such as those in Florida), in which it occurs in low percentages, may be undertaken by International Minerals and Chemical Corp., according to Louis Ware, International Minerals president. Ware said he hoped that his firm would be able to produce uranium in appreciable quantities, and on a profitable basis. Now, he said, International Minerals is "engaged in some work" for the USAEC.

None of the 600,000 shares of Tanganyika Concessions, acquired by American firms, will be reoffered for public sale in the U.S., it has now been learned. Associated in the purchase with Ladenburg, Thalmann & Co., and Lazard Freres, both of New York, was the International Basic Economy Corporation, of the Rockefeller family, and David Rockefeller. Tanganyika Concessions owns a 14% interest in the Union Miniere du Haut-Katanga, the large Belgian mining company which operates the Belgian Congo Shinkolobwe uranium pits, world's richest source of pitchblende, and main U. S. supplier of uranium. It also owns a 90% interest in the Benguela railroad, outlet to the sea for the uranium (and other) mines in the Belgian Congo. (Now, only one Union Miniere uranium property is being actively exploited. However, there are at least six more pitchblende properties of the same order of magnitutde as the one now being worked.)

NEW PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear work...

FROM THE MANUFACTURERS- Model 706 direct-reading decimal counting unit has a maximum counting rate of 200,000 pulses per second, with a 2.5 microsecond resolution of pulse pairs. Signal input requires a negative pulse of 50 to 150 volts peak amplitude negative with respect to B plus. Rise time must be less than 0.1 microsecond and duration at least 0.2 microsecond. Size: 1-1/2" wide by 15" long & 4-1/4" deep, including tubes. Model 707 direct-reading decimal counting unit has a maximum counting rate of 1,000,000 pulses per second, with an 0.8 microsecond resolution of pulse pairs. Signal input requires a negative pulse of 120 to 180 volts peak amplitude negative with respect to B plus. A rise time of less than 0.1 microsecond and duration of at least 0.1 microsecond is required. Size: 2-3/4" wide, by 15" long, & 4-1/4" deep, including tubes. Both these high-speed units are designed for scale-of-10 operations, and provide direct reading from a remote indicator. They can be arranged in banks to provide any desired total count capacity; units are interchangeable without adjustment.--Berkeley Scientific Co., Richmond, Calif.

Survey meter, model K-352; an improved model of the Oak Ridge National Laboratory "Cutie Pie". Meter, 2½" in diameter, reads directly in mr/hr on a linear scale, with full scale readings of 50, 500 and 5000. Ion chamber made from 3" diameter, 1/6" thick wall, paper-base bakelite tubing, with the interior coated with Aquadag. A large thin window, 0.0002" thick and 2-1/2" in diameter, permits most beta radiation, and some alpha, to enter the ion chamber, when the 18" thick shield is removed. Will detect x-radiation down to 50 KV and lower, it is said. Filament and plate voltage batteries have life of 150-hours; chamber voltage batteries have life of 1-year. Instrument is held by handle of the pistol-grip type.--Kelley-Koett Instrument Co., Covington, Ky.

NUCLEONIC MANUFACTURERS' EXHIBIT- Manufacturers whose talent and facilities are devoted entirely (in many cases) to producing instruments and products for nuclear applications showed some of their devices last week at the Park Sheraton Hotel, New York. Occasion was the 3rd annual "Conference on Electronic Instrumentation in Nucleonics and Medicine", sponsored by the radio and electrical engineering societies (IRE and AIEE). Exhibitors included: Amperex Electronic Co., Brooklyn, N.Y.; Anton Electronic Laboratories, Inc., Brooklyn, N.Y.; Atomic Instrument Co., Boston, Mass.; Beckman Instruments, Inc., Pasadena, Calif.; Cambridge Instrument Co., New York, N.Y.; Allen B. DuMont Laboratories, Inc., Clifton, N.J.; El-Tronics, Inc., Phila., Pa.; General Electric Co., Schenectady, N.Y.; Kelley-Koett Man. Co., Covington, Ky.; W. S. Macdonald Co., Cambridge, Mass.; Nuclear Instrument & Chemical Co., Chicago, Ill.; Photovolt Corp., New York, N.Y.; Radiation Counter Laboratories, Inc., Chicago, Ill.; Radioactive Products, Inc., Detroit, Mich.; Streeter-Amet Co., Chicago, Ill.; Tracerlab, Inc., Boston, Mass.; and Victoreen Instrument Co., Cleveland, Ohio.

INSTRUMENT AND PRODUCT DEVELOPMENT- In the course of work on the detection of alpha, beta and gamma rays, by recording scintillations from crystals in photo-sensitive Geiger counters, a survey was conducted during which inorganic crystals were produced, with emphasis upon the silver activated alkali halides. The work, at Bartol Research Foundation, and the Franklin Institute, Pa., undertaken by C. E. Mandeville, and H. O. Albrecht, considered NaCl-Ag; NaBr-Ag; NaBr-Tl; powdered Durene; KCl-Ag; LiCl-Ag; LiBr-Ag. It was observed that the most satisfactory crystal, for general purposes (and the only one of this group satisfactory for alpha, beta and gamma rays), was NaCl-Ag.

Sodium metal, as a heat exchanger for nuclear reactors, is now under investigation at Knolls Atomic Power Laboratory, Schenectady. Last week, Dr. Leo F. Epstein, of KAPL, told the National Academy of Sciences, in Schenectady, how he had measured the solubility of iron in sodium at various temperatures, after heating the sodium under vacuum in an iron vessel. He said analysis showed that at 212 deg. F., one and one-half parts of iron per million total were dissolved in the sodium metal. With higher temperatures this increased, reaching 13.5 parts per million at 930-degrees, F.

NEWS & NOTES- A move to larger quarters has been made by Nuclear Development Associates, Inc., formerly of Manhattan, in New York City. New address is now 80 Grand Street, White Plains, N. Y.

ATOMIC PATENT DIGEST...latest application & grants...

NOW AVAILABLE TO U. S. BUSINESS FIRMS is a further group of 17 patents and 3 applications, the outgrowth of Government work in the nuclear field in the U. S. For information on obtaining licenses, which are royalty-free, but non-exclusive, on the following list (or on other of the present total of 185 such patents and applications), write the Patent Branch, USAEC, Wash. 25, D.C. This latest list comprises: (1) Valve for rotating device; Pat. No. 2,521,891. (2) Low inductance resistor; Pat. No. 2,521,894. (3) Method of purifying inert gases; Pat. No. 2,521,937. (4) Resistance capacitance network; Pat. No. 2,523,856. (5) Extraction process for cerium; Pat. No. 2,523,892. (6) Neutron velocity selector; Pat. No. 2,524,379. (7) Production of uranium triiodide; Pat. No. 2,524,384. (8) Saturable core triggered gap; Pat. No. 2,524,388. (9) Scaling circuit; Pat. No. 2,524,692. (10) Thermal flowmeters; Pat. No. 2,525,197. (11) Processes for production of mesitylene; Pat. No. 2,526,213. (12) Method of forming uranium carbon alloys; Pat. No. 2,526,805. (13) Fluid selecting apparatus; Pat. No. 2,526,825. (14) Dehydration of alkali-metal acid fluorides; Pat. No. 2,527,320. (15) Electromagnetic pumps; Pat. No. 2,528,415. (16) Stuffing box and expansion joint; Pat. No. 2,528,436. (17) Coating process; Pat. No. 2,528,454. (18) Method and apparatus for measuring radiation quantities, Appl. No. 157,069. (19) Gamma and x-ray dosimetric method; Appl. No. 158,282. (20) Portable radiation survey instrument; Appl. No. 184,304.

NEW BOOKS & OTHER PUBLICATIONS...in the nuclear energy field...

Economic Aspects of Atomic Power, By Sam H. Schurr & Jacob Marschak. The potential uses of atomic power by (1) generation of electricity from heat caused by nuclear reactors, and (2) transportation of low-temperature heat over short distances, as compared to presently used methods. An analytical study has also been made of the potential applicability of atomic power to such industries as: production of aluminum, chlorine, and caustic soda, phosphate fertilizer, cement, brick, flat glass, iron & steel; railroad transportation; and residential heating. The work presents an estimate of the economic effects of atomic power on a highly industrialized area, and on the so-called backward areas. 287 pages.-- Princeton University Press, Princeton, N.J. ($6.00)

Fluorine Chemistry. Edited by J. H. Simons, director, Fluorine Laboratories, Pennsylvania State College. Fluorine chemistry treated as a unit, with the various chapters written by authorities in their fields. Basic chemistry underlying use of anhydrous hydrogen fluoride in the production of uranium hexafluoride for the separation of isotopes; extreme properties of the element and its compounds; commercial possibilities of fluorine compounds; are some of material discussed. Volume I. 615 pages. (Vol. II, 1951, in preparation) --Academic Press, New York 10, N.Y. ($12.00)

Security, Loyalty, and Science, by Walter Gellhorn. An evaluation of the results of government security and loyalty programs, and their effect upon scientists and their work. 300 pages. --Cornell University Press, Ithaca, N.Y. ($3.00)

Pile-Produced Isotopes: A Catalogue. Services and materials available from the Canadian nuclear reactor establishment.--Isotopes Br., NRC, Atomic Energy Project, Chalk River, Ontario (Canada). ($2.00 Canadian)

List No. 17. A revised and cumulated listing of unclassified, declassified, and other documents in lists 13-16, plus latest additions. Listings (n/c) available from Tech. Info. Service. USAEC, Oak Ridge, Tenn. Documents to be bought from Office of Technical Services, Dep't. of Commerce, Wash. 25, D.C.

Survival Under Atomic Attack. The first official U. S. informative guide for "the man in the street on the essentials of survival under an atomic bombing. Non-technical and authoritative. Prepared by USAEC and other agencies for Civil Defense Office of NSRB (the government agency with civil defense as its responsibility). 32 pages. Superintendent of Documents, Washington 25, D. C. (10¢)

How to Survive an Atomic Bomb, by Richard Gerstell. A handbook on atomic defense. Two editions: (1) Combat Forces Press, Wash., D.C., distributed by Rinehart & Co., New York.-- $1.95. (2) Bantam Books, New York.-- 25¢.

RADIOISOTOPES & IONIZING RADIATION... in various fields...

NON-DESTRUCTIVE TESTING: The use of radioistopes, from the Harwell (England) atomic pile, for industrial radiography, was outlined recently at Birmingham University, at a meeting of the British Association. W. S. Eastwood, Harwell, who described such applications, said the Harwell pile is now producing gamma-emitting sources having conveniently long half-lives--60 days to 5 years--and a wide range of gamma-ray energies. Most in demand, he observed, are radiocobalt (half-life 5.3 years; energy 1.1, 1.3 Mev); radio-iridium (half-life 70 days; energy 0.30, 0.47, 0.60 Mev); and radiotantalum (half-life 120 days; energy 0.15, 0.22, 1.13, 1.22 Mev). Mr. Eastwood stated that in the future, sources of europium (half-life 5 years; energy 0.12, 034. 0.41, 1.2 Mev) and cerium (half-life 275 days; energy 1.25, 0.22 Mev) would be available. These radioactive sources, he stated, are standardized in the form of cylinders with a diameter equal to length, and with dimensions of 6 mm., 4 mm., and 2 mm. Specific activities are as high as several curies per gram.

BIOLOGICAL RESEARCH: Radiophosphorous (P-32) was found useful as a labeling agent for spores in a study of the respiratory retention of aerosols, conducted at the Microbiological Research Department, Porton (England) by F.E. Buckland, G. J. Harper, and J. D. Morton. Guinea pigs were exposed to aerosols of normal spores, and viable counts were made on disintegrated head, trachea, and lungs. Further guinea pigs were exposed to aerosols of radioactive (P-32 labeled) spores, and both viable and radioactive counts were made. The experimenters point out that, in these experiments, the radioactive measurements were far more convenient, and, they believe, probably gave sufficiently accurate results. Additionally, exposures were made to aerosols of the supernatant fluid from centrifuged radioactive suspensions. Here it was found that the water-soluble activity, which was usually less than 5% of the total, did not significantly affect results.

The effects of internal irradiation of mice with phosphorous-32 have been investigated at Harvard Medical School (Laboratory of Pathology) by Shields Warren, Jane C. MacMillen, and Frank J. Dixon. Using adult Swiss strain mice, divided into four groups, a different dose of carrier-free P-32 in saline solution was injected subcutaneously into each three groups. The tissue showing radiation injury earliest was found to be the thymus, but the thymus also appeared to possess a "radioresiliency" since it returned to normal most rapidly and completely. The splenic tissue and bone marrow appeared about the same in sensitivity to P-32, but bone marrow was more nearly completely destroyed than the splenic tissue, by an equal dose. Lymph nodes were the last tissue to show morphologic recovery from effects of radiation. By 84 days, lymph nodes still were not completely restored, but continued to show a scanty proliferation begun at 15 to 20 days after injection. From these observations, the experimenters have concluded that, in general, the destructive effects in the tissues of irradiated mice increase directly with the size of dose of P-32, and that the degree of injury and regeneration varies with type specificity of the tissue.

INDUSTRIAL APPLICATIONS: Static eliminators, containing thallium-204, are now being produced experimentally with the atomic pile at Harwell (England), and are being loaned to firms for trial. (In the United States, polonium has found use in static eliminators, which are for dissipation of undesirable electric charges.)

FOOD PROCESSING: Bread, meat and other foods have been preserved for periods as long a year without refrigeration, as a result of bombardment with 800,000 electron-volt cathode rays, in experiments at the General Electric research laboratories. E. J. Lawton, of G-E, who described the work at the recent meeting in Schenectady of the National Academy of Sciences, said that it was possible to kill micro-organisms on edible products, without raising the temperature of the food stuffs materially.

Sincerely,

The Staff,
ATOMIC ENERGY NEWSLETTER

November 7th, 1950.